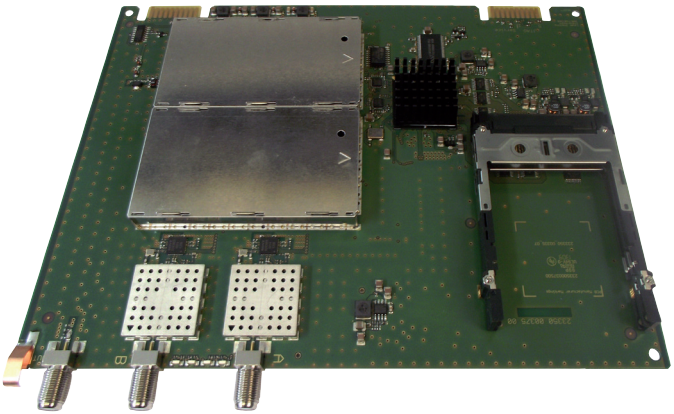
Assembly Instructions

English

Grundig SAT Systems

Head-End Station STC 160
Head-End Digital Transodulator
2 x DVB-C2/T2 ➞ QAM

HD2CT 860 C



Notes on the Assembly Instructions.
As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.

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1 Safety regulations

- The standards EN/DIN EN 50083 resp. IEC/EN/DIN EN 60728 must be observed.
- Do not perform installation and service work during thunderstorms.
- Assembly, installation and servicing should be carried out by authorised electricians.
- Switch off the operating voltage of the system before beginning with assembly or service work.
- Avoid short circuits!
- Observe the relevant standards, regulations and guidelines on the installation and operation of antenna systems.
- To ensure electromagnetic compatibility, make sure all connections are tight and the covers are screwed on securely.
- No liability is accepted for damage caused by faulty connections or inappropriate handling of the device.

Check the head-end station STC 160 according to the safety instructions listed in their assembly instruction.

Take precautions to prevent static discharge when working on the device!

Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2002/96/EC of the European Parliament and the European Council from January 27, 2003 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 General information

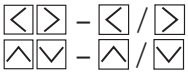
2.1 Scope of delivery

1 Digital Transmodulator QAM "HD2CT 860 C"
1 RF connection cable
1 Brief Assembly Instructions

2.2 Meaning of the symbols used

Important note

—> General note

 Optional use of the buttons

• Performing works

2.3 Technical data

The requirements of the following EU directives are met:
2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling (page 35).

Unless otherwise noted all values are specified as "typical".

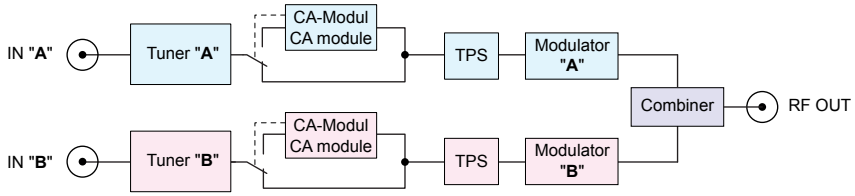
RF input
Frequency range: ..... 42 ... 862 MHz
Channel range: .....C 05 ...C 12, S 21 ... S 41, C 21 ... C 69
Input level: ..... 60 dBµV ... 80 dBµV
Input impedance:.....75 Ω

RF output
Frequency range: ..... 42 MHz ... 860 MHz
Channels: .....S21 ... C69
Output level: .....75...85 dBµV
Output impedance: .....75 Ω

Connections:
RF inputs: .....2 F sockets
RF output: ..... 1 F socket
Connection strip (20-pin):.....for supply voltages and control circuits
Common Interfaces: .....2 (several channels can be descrambled).

2.4 Description

The twin transmodulator module converts signals modulated according to DVB-C/C2/T/T2 standard into two QAM modulated signals for feeding into a cable network. The module has two digital RF inputs and one RF output.



The module is equipped with two channel strips. Using adequate CA modules scrambled channels can be descrambled via tuner "A" and "B".
LEDs provide an indication of the input signal quality based on their colour and indicate if the respective channel strip is switched on (LED illuminates) or off.

LED indicator	Indication
Green	Signal quality is good
Orange	Signal quality is poor
Red	No signal
Red<–>Green	Data rate overflow (output)
Off	Channel strip (modulator) off

The QAM modulated RF output signals are sent through the RF output of the module to the output collector.
When the head-end station is switched on, the two-line LC display shows the "**SETUP**" menu and the software version of the control unit. The head-end station output level can be adjusted in this menu.
The control of the module takes place via the control unit of the head-end station. To operate the QAM module the software version of the control unit (head-end station) must be "**V 10**" or higher. The operating software of the QAM module and the head-end station can be updated using a PC and the software "**BE-Flash**" via the 9-pin D-SUB socket on the head-end station. You can find the current operating software for the head-end station and the QAM module, the software "**BE-Flash**" and the current assembly instructions on the website "***www.gss.de/en***".

The QAM module is designed exclusively for use in the STC 160 head-end station.

2.5 How the TPS module works

After decoding the satellite signals, the demodulated data streams can be accessed via the integrated TPS module. These data streams, also called transport streams, contain several stations with all their components (video, audio, data and service information), which can be changed using the TPS module.

Station filter

Individual stations can be deleted. This reduces the data rate and, consequently, the output data rate.

Changing the Transport stream and ORGNET-ID

The transport stream ID can be changed. If the stations of a transponder are split into the transport streams of different channel strips, a new identification must be allocated to the "new" transport streams to realise the channel search of the settop boxes connected without mistakes.
If the ORGNET-ID is changed a new NIT must be generated.

Changing the NIT

The transport stream contains data in the form of tables which the receivers evaluate and require for convenient use. The TPS module can adjust the "Network Information Table" (NIT) to accommodate the new stations output data (incl. LCN). The "NIT" contains data which is required by the set-top boxes connected to the cable network for the automatic search feature.

3 Installation

– Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
– Before installing or changing a module, switch off the head-end station or unplug the power cable from the mains power socket.

– Take measures to protect against ESD!

- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.

3.1 Retrofitting a CA module

The module is equipped with two common interfaces. This allows you to connect two CA modules for various scrambling systems and service providers. Scrambled channels can only be descrambled with a CA module suitable for the scrambling system and the corresponding smart card. The smart card contains all the information for authorisation, descrambling and subscription.

- Check with the distributor or manufacturer of the CA modules to be used to ensure that they are suitable for descrambling several channels.
- **The hardware and software of this module have been thoroughly prepared and tested.**
- **Any changes made by programme provider to the structures in the programme data might impair or even prevent this function.**
- When working with the CA modules, please read the corresponding operating manuals from the respective providers.

- Insert the smart card (1) into the CA module (2) so that the chip (3) on the smart card faces the thicker side (top) of the CA module (fig. 1).
- Push the CA module (2) without canting into the guide rails (4) of the common interface (5) according to the following picture and contact it to the common interface.

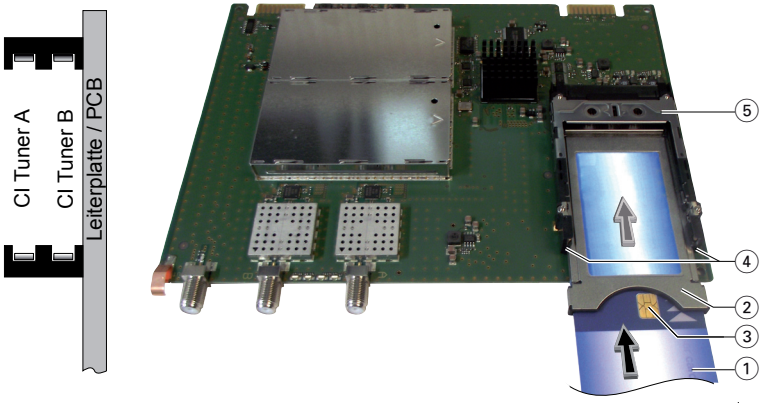


Fig. 1

—> If the QAM module is inserted in the head-end station, the left common interface is assigned to tuner A, the right one to tuner B.

3.2 Installing the QAM module

– Check that the plug contacts of the CA module are tightly seated in the terminal strips on the common interface of the QAM module and make sure there is reliable contact.
– When installing a module, make sure that it is inserted in one of the long, numbered grooves in front of the contact strip on the board at the rear wall of the housing.
– The shorter, non-numbered grooves without a contact strip on the board at the rear wall of the housing are for add-on modules only.

- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.
- Open the locking device (1) in the direction of the arrow (fig. 2).

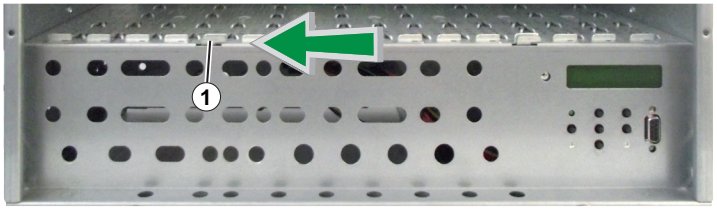


Fig. 2

- Insert the QAM module in grooves (A) of an open slot (with contact strip on the board at the rear wall of the housing) and gently slide it into the head-end station until it makes contact with the board on the rear wall (fig. 3).
- After installing the QAM module close the locking device (C) in the direction of the arrow (fig. 3). Ensure to get a well contact to spring (B).

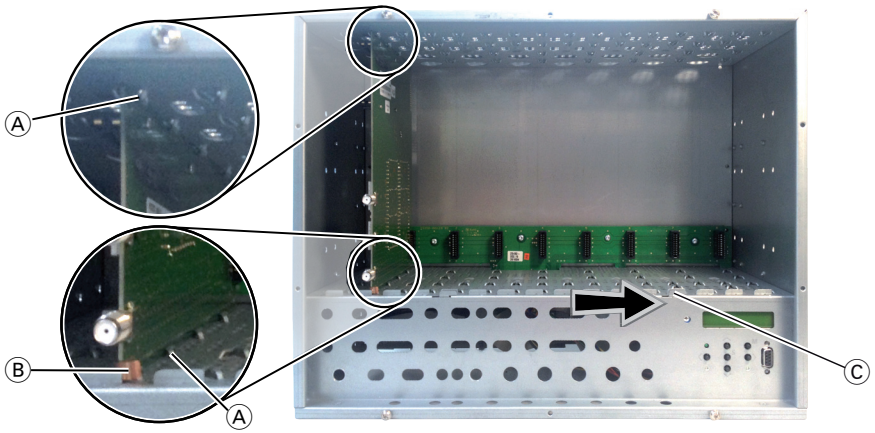


Fig. 3

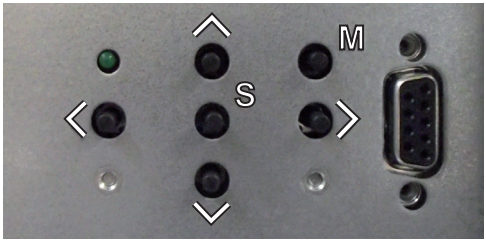
Fig. 4

- Connect the RF inputs (E) (input "A") and (F) (input "B") on the QAM module (fig. 4) to corresponding signal sources via the preinstalled F terminals in the rear wall of the head-end station through the cable inlets (H) using RF cables made on-site.
- After programming, connect the modulator output (G) to one of the input sockets (I) of a retrofitted output collector.

- Connect the head-end station to the mains power supply.

4 The control panel at a glance

4.1 Functions of the control panel buttons



< > To move the cursor

^ v To adjust values and functions

S To save the programmed data

M To switch to the next menu

4.2 Menu items

Program the QAM module using the buttons on the head-end station control panel. The menus appear on the two-line display of the control panel.
The parameters and functions to be set are underlined.

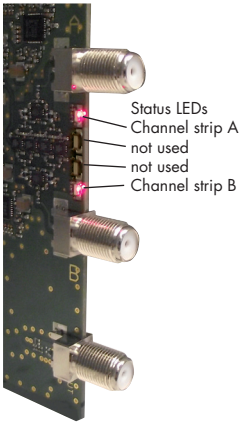
With the ^ button select the channel strip / other modules.
You can use the M button to select the following menu items:

- Output signal settings:
  Modulator on/off, level
  Output channel / Output frequency
  QAM modulation
  Substitute signal
- Input signal settings:
  Kind of modulation
  Input channel / frequency
  Station filter
  CA module
  Economize descrambling capacity
- Options:
  Transport stream and ORGNET-ID
  BAT, STD-other
  Deleting a PID
  Renaming a PID
- Data rate
- Network Information Table (NIT)
- Factory reset

5 Programming

5.1 Preparation

- Test the software versions of the head-end station and the QAM module and update them if necessary. The current software versions can be found on the website "***www.gss.de/en***".
- Connect the test receiver to the modulator output on the QAM module Ⓖ or to the RF output on the output collector if it is already connected (page 9).
- Adjust the test receiver to the output channel / output frequency of the channel strip to be set.
- Switch on the channel strip (modulator) if necessary (page 16). For each channel strip, there is an status LED which indicates if the channel strip is switched on.

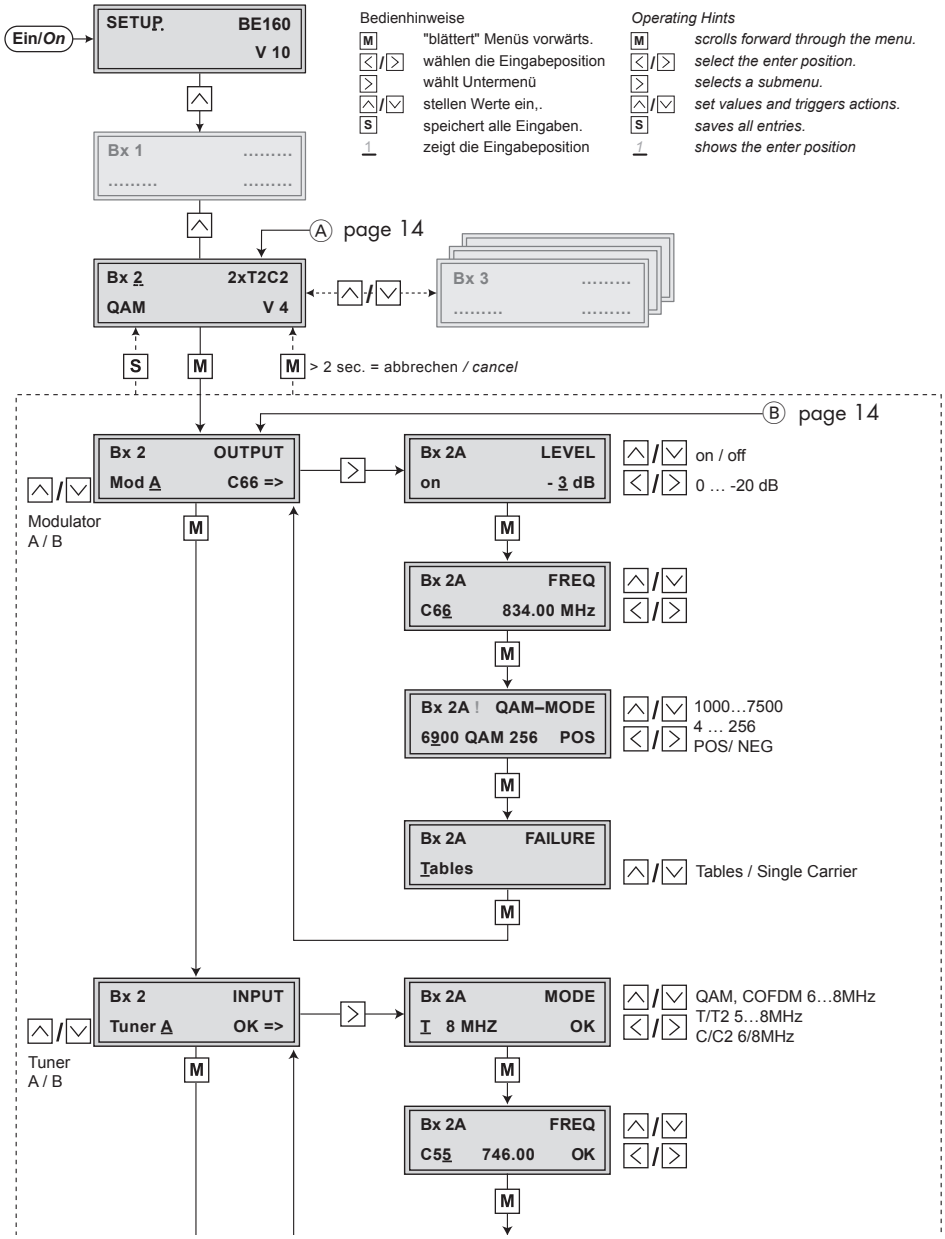


- Balance the output levels of the channel strips and level them to the output levels of the modulators of other modules used if the difference in level is ≥ 1 dB (page 16).

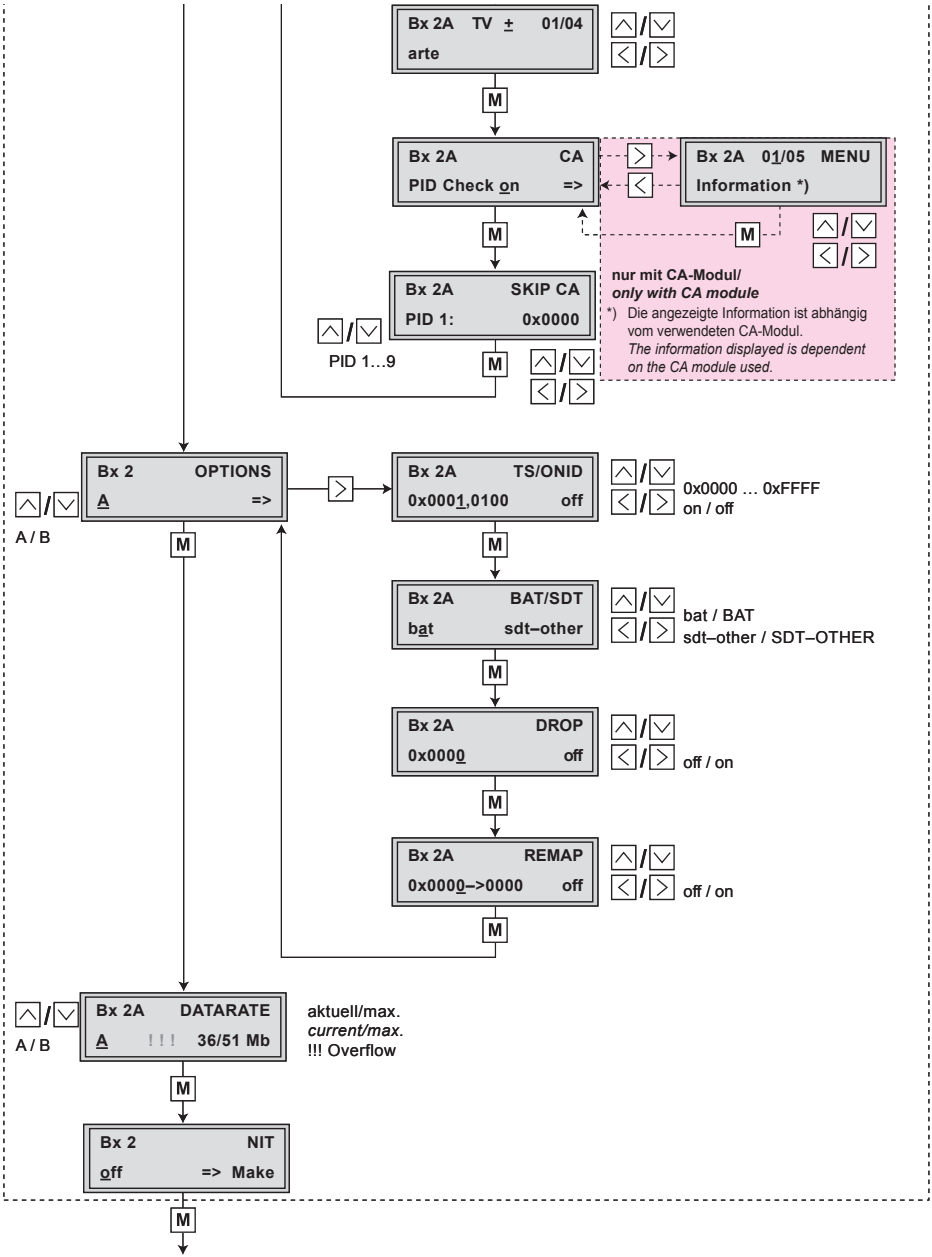
5.2 Notes on level setting

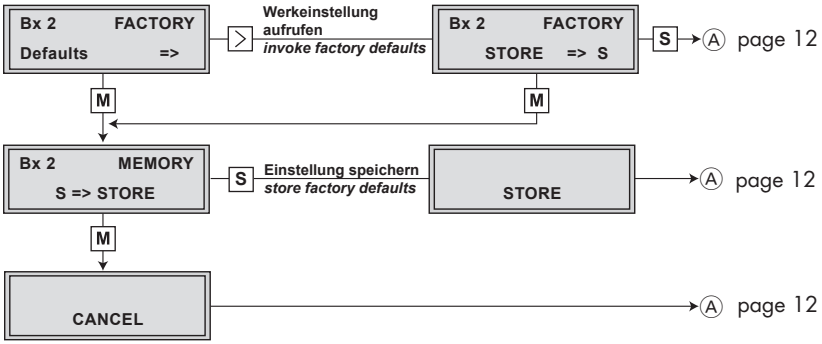
In order to prevent interference within the head-end station and the cable system, the output level of the module must be decreased by 10 dB compared to analogue modules at 64 QAM, and by 4 dB compared to analogue modules at 256 QAM.

5.3 Programming procedure



Bedienhinweise		*Operating Hints*	
M	"blättert" Menüs vorwärts.	M	*scrolls forward through the menu.*
< / >	wählen die Eingabeposition	< / >	*select the enter position.*
>	wählt Untermenü	>	*selects a submenu.*
^ / v	stellen Werte ein,.	^ / v	*set values and triggers actions.*
S	speichert alle Eingaben.	S	*saves all entries.*
1	zeigt die Eingabeposition	1	*shows the enter position*


Bx 2A TV ± 01/04
arte
M
Bx 2A CA
PID Check on =>
Bx 2A 01/05 MENU
Information *)
M
Bx 2A SKIP CA
PID 1: 0x0000
PID 1…9
M
nur mit CA-Modul/
only with CA module
*) Die angezeigte Information ist abhängig vom verwendeten CA-Modul.
The information displayed is dependent on the CA module used.
Bx 2 OPTIONS
A =>
A / B
M
Bx 2A TS/ONID
0x0001,0100 off
0x0000 … 0xFFFF
on / off
M
Bx 2A BAT/SDT
bat sdt–other
bat / BAT
sdt–other / SDT–OTHER
M
Bx 2A DROP
0x0000 off
off / on
M
Bx 2A REMAP
0x0000–>0000 off
off / on
M
A / B
Bx 2A DATARATE
A ! ! ! 36/51 Mb
aktuell/max.
current/max.
!!! Overflow
M
Bx 2 NIT
off => Make
M



5.4 Programming the QAM module

Notes:

– Entries are saved by pressing the S button.

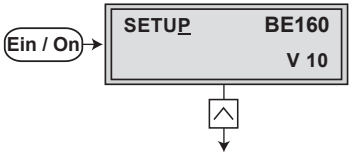
—> You will be returned to "**Selecting the module/channel strip**".

– The programming process can be cancelled by pressing and holding the M button.

—> Changes will NOT be saved.
—> You will be returned to "**Selecting the module/channel strip**".

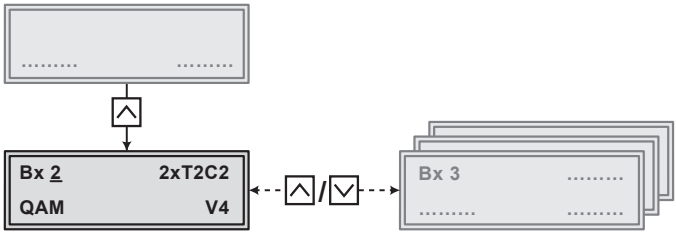
• Switch on the head-end station.

—> The display shows "**SETUP BE160**" and the software version of the head-end station (e.g. V 10).
—> The output level of the output collector can be adjusted in the "**SETUP**" menu (see STC 160 assembly instructions).



SELECTING THE MODULE / CHANNEL STRIP

- If necessary, press [∧][∨] repeatedly to select the particular module (**Bx** …) to be programmed.



—> The display shows, e.g., the **Bx 2** **2xT2C2** **QAM** **V 4** menu.

"**Bx 2**"	indicates the slot no. 4
"**2xT2C2 QAM**"	type of the module
"**V 4**"	software version of the module

- Press the [M] button.

—> The "Output parameter" – "**OUTPUT**" main menu is activated.

OUTPUT PARAMETER

In this menu you select the modulator for which you would like to do the output parameter settings in the related submenus.

—> In order to skip the "Output parameter settings", press button [M].

—> For example an indicated "C66" shows the current channel set. If "C – –" is displayed a frequency which does not correspond to the DVB-C channel-/frequency grid was set.

- Using buttons [∧][∨] select the desired modulator.

- Press the [>] button.

—> The "Modulator on/off, Level" – "**LEVEL**" submenu is activated.

Modulator on/off, Level

This menu item is used to set the output levels of the modulators of the module to the same value and to level them to the output levels of the modulators of other modules used and to switch the modulators on or off.

Bx 2A/B	LEVEL
on	– 3 dB

Level setting:

- Measure and note down the output level of all modulators (of the whole head-end station).
- By pressing [^][v] adjust the higher output level to the output level of the modulator with the lowest output level incrementally.

Switching the modulator on or off:

- Use the [<] button to place the cursor under "on" resp. "off".
- Use the [^][v] buttons to switch each modulator on or off.

- Press the [M] button.

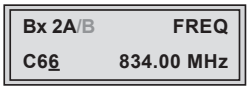
—> The "Channel / Frequency" – "**FREQ**" submenu is activated.

Channel / Frequency

In this menu you can adjust the output channel or the output frequency of the respective modulator.

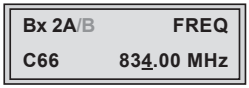
—> The QAM signal is normally transmitted with a bandwidth of 8 MHz. This means that you can only use the existing channel grid in the range of channels S21…C69 (frequency grid 8 MHz).
The CCIR channel grid is 7 MHz in the range of the lower frequency bands (channels C5 … C12, S2…S20). If 8 MHz QAM signal packages are transmitted in these channel ranges, this will result in interference (overlapping) and transmission problems.
For programming in these channel ranges and in the frequency ranges below them, we recommend starting with frequency 306 MHz going back in steps of 8 MHz (see frequency table on page 34).
Please note thereby that many receivers cannot receive the channel ranges S21 … S41 (306 … 466 MHz).

Channel setting:



- Use buttons < > to select the cursor position for channel setting.
- Use buttons ∧ ∨ to adjust the desired channel.

Frequency setting (42,0 MHz ... 860,0 MHz):



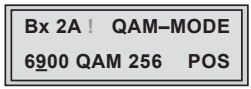
- Use buttons < > to select the cursor position for frequency setting.
- Use buttons ∧ ∨ to adjust the desired frequency.

- Press the M button.

—> The "Output symbol rate, QAM modulation" – "**QAM-MODE**" submenu is activated.

OUTPUT SYMBOL RATE, QAM MODULATION

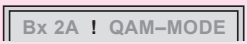
In this menu you can set the output symbol rate, the QAM modulation and invert the user signal.



Output symbol rate:
In this menu item you can set the output symbol rate.

- Use the < > buttons to place the cursor under the number to be changed of e.g. "6900" and set the symbol rate with the buttons ∧ ∨.

—> A displayed "!" indicates an output data overflow (page 29).

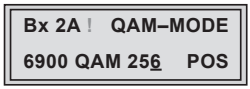


In this case increase the output symbol rate or the QAM modulation or remove stations from the data stream using the station filter.

QAM-Modulation:
In this menu item you can set the QAM modulation.

—> For higher QAM modulation, the output symbol rate is lowered. An output QAM modulation of > 64 QAM places a large burden on the cable network. Due to noise, delay and frequency response problems, reception of the converted output signal can be affected.

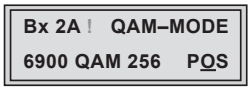
- Use buttons [<][>] to select the cursor position for "**QAM...**" setting.



- Use buttons [^][v] to set the QAM modulation ("**4**" ... "**256**").

Inverting the user signal:
For exceptional cases and "older" digital cable receivers, the spectral position of the user signal can be inverted "**NEG**". Factory default is "**POS**".

- Use [<][>] to place the cursor under "**POS**".



- Use [^][v] to set the spectral position to "**NEG**".

- Press the [M] button.

—> The "Substitute signal in the case of an incorrect input signal" – "**FAILURE**" submenu is activated.

SUBSTITUTE SIGNAL IN THE CASE OF AN INCORRECT INPUT SIGNAL

You use this menu to set whether a "**Single Carrier**" signal should be provided or the self-made tables "**Tables**" should transmitted furthermore whenever an incorrect input signal occurs.

- Use the ⋀⋁ buttons to set the required output signal.
- Press the M button.

—> Returning to "Output parameter" main menu (page 15).
—> If necessary set further modulators.

- Press the M button.

—> The "Input parameter" – "**INPUT**" main menu is activated.

Input parameter

In this menu you select the channel strip (line) for which you would like to do the input parameter settings in the related submenus.

—> In order to skip the "Input parameter settings", press button M.
—> "OK" indicates a present input signal.

- Using the buttons ∧∨ select the desired channel strip.
- Press button >.

—> The "Kind of modulation" – "**MODE**" submenu is activated.

Kind of modulation

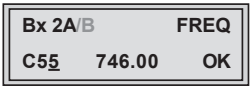
In this menu set the kind of modulation and the symbol rate (only QAM) of the input signal.

- Select the kind of modulation of the transponder (T 6/7/8 MHz, T2 5/6/7/8 MHz, C2 6/8 MHz, C) using buttons ∧∨.
- Press the **MODE** button.

—> The "Input channel / frequency" – "**FREQ**" submenu is activated.

Input channel / frequency

In this menu you set the input channel / input frequency of the transponder you would like to receive.



- Use buttons [<][>] to position the cursor under the digit of the frequency resp. channel displayed to be set.
- Press buttons [^][v] to set the desired channel/frequency.

—> Once the RF receiver has synchronised to the input signal, "OK" is displayed.

—> If "– –" appears in the second line of the display, there is no input signal present. Check the configuration of the antenna system and the head-end station as well as the preceding settings of the module.

—> The quality of the received transport stream is indicated by a status LED:

LED indicator	Indication
Green	Signal quality is good
Yellow	Signal quality is insufficient
Red	No signal
Blinking red/green	Data overflow of the output data rate
Off	The channel strip (modulator) is switched off

- Press the [M] button.

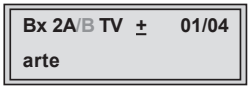
—> The "Station filter" – e.g. "**01/04**" submenu is activated.

Operation with a CA module

In order to descramble scrambled channels a corresponding smart card is needed.
The channels to be descrambled are set in submenu "station filter".

Station filter

In this menu stations (services) of a transponder can be switched off.
Herein you select which scrambled station should be descrambled using an adequate CA module.



—> All stations from the channel strip will be read, and then displayed with name and station type.

—> If no station is found, the following message will appear in the display: "**FILTER no Service**". In this case, check the configuration of the antenna system and head-end station, as well as the previously adjusted settings for the module.

—> The display shows e.g.: **Bx 2A TV + 01/04**
arte

Meaning of the indicators in the example:

"**Bx 2A**"	Slot 2, channel strip "**A**"
"**TV**"	TV channel type
" **+** "	The currently selected station is switched on.
"**01/04**"	The 1st of 6 stations is being displayed.
"**arte**"	Station name

Further possible terms displayed:

"**RA**"	Radio channel type For radio stations, the background of the screen of the connected TV or test receiver is darkened.
" **–** "	The currently selected station is switched off.
" * "	The star means that the TV or radio station selected is scrambled. To enable the station, the CA module and the appropriate smart card of the station provider are required.

—> If a service number (e.g. "**131**") appears instead of "**TV**" or "**RA**", this indicates that an unnamed station or an undefined data stream is being received.

- Use the < > buttons to call up the stations in sequential order, then use ^ v to activate (indicated by " **+** ") or to deactivate them (indicated by " **–** ").

—> If a station is scrambled (indication "*"), in this menu you select whether it should be descrambled using an adequate CA module.

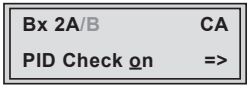
- Press button ^ twice to descramble a station (indication "X").

- Press the M button.

–> The "PID monitoring" – "**CA**" submenu is activated.

PID MONITORING

In this menu you can switch off the PID monitoring and call up a menu for the settings of the CA module (dependent on the CA module).



PID monitoring:

—> The factory default of the PID monitoring is switched on.
If particular PIDs are not descrambled the CA module is reset. Additionally dropouts may occur if several stations are descrambled. To prevent this the PID monitoring can be switched off.

- Use the ⋀⋁ buttons to switch "**off**" or "**on**" the PID monitoring.

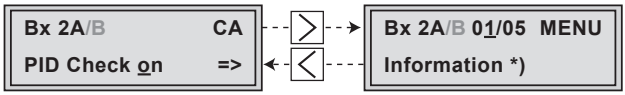
Menu of the CA module

- Use the > button to activate the menu of the CA module.

—> Access to this menu is only possible with installed **CA module** and inserted smart card.

CA MODULE

The menu varies according to which CA module you are using. For this reason, please refer to the operating manual of your particular CA module. The relevant information is shown in the display of the head-end station. This may appear as a fixed display or as scrolling text according to display capabilities.



—> The display shows e.g.: **Bx 2A 01/05 MENU**
Meaning of the indicators:
"**Bx 2A**" Slot 2, tuner "**A**"
"**01/05**" The first of five menu items is activated.
"**MENU**" The menu of the CA module is activated.

*) For the explanation of further details please use the operating instructions of the CA module used.

- Use the ⋀⋁ buttons to activate the menu desired.
- Press the > button to activate the menu.
- Use the ⋀⋁ buttons to select the function desired.
- To set the CA module use the <> and ⋀⋁ buttons.

—> By pressing the M button you can cancel the settings in the menu of the CA module and are returned to the "PID monitoring" – "**CA-MENU**" menu.

- All settings are saved by pressing the S button.

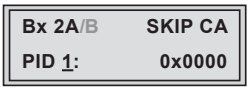
—> You will be returned to the "PID monitoring" – "**CA**" menu.

- Press the M button.

—> The "Economize descrambling capacity" – "**SKIP CA**" is activated.

ECONOMIZE DESCRAMBLING CAPACITY

In this menu up to 9 not needed PIDs (e.g. audio PIDs of foreign language versions) can be excluded from the descrambling in order to economize descrambling capacity.



- Using buttons [∧][∨] select the desired memory location (PID 1…9) .
- Use [<][>] to position the cursor under the digit of PID to be set.
- Press [∧][∨] to set the respective digit of the PID needed.
- Repeat the procedure by the quantity of the digits to be set.

—> If required select another memory location and enter the next PID which shall **not** descrambled.
—> To delete a stored PID, overwrite it by "0000".

- Press the [M] button.

—> Returning to "Input parameter" - "**INPUT**" main menu (page 20).
—> If required set a further channel strip.

- Press the [M] button.

—> The "Option settings" – "**OPTIONS**" main menu is activated.

Option settings

In this menu you select the channel strip for which you would like to do the option settings in the related submenus.

—> In order to skip the "Option settings", press button [M].

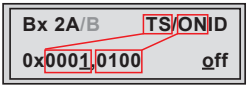
- Using the buttons [∧][∨] select the desired channel strip.
- Press button [>].

—> The "Transport stream ID and ORGNET-ID" – "**TS/ONID**" submenu is activated.

Transport stream ID and ORGNET-ID

If the stations of a transponder are split into the transport streams of several channel strips, a new identification must be allocated to the further transport streams to realise the channel search of the settop boxes connected without mistakes.

—> If the ORGNET-ID is changed also a new NIT must be generated (page 30).



- Use the [<][>] buttons to position the cursor under the digit of the hexadecimal number to be set.
- Press [∧][∨] to set the respective digit of the hexadecimal number.
- Repeat the procedure by the quantity of the digits to be set.
- Using the [>] button place the cursor under "**off**" and switch "**on**" the transmitter identification using the [∧][∨] buttons.

—> By pressing the [<] button you return to the hexadecimal number setting.

- Press the M button.

—> The "BAT/SDT-OTHER tables" – "**BAT/SDT**" submenu is activated.

BAT/SDT-OTHER TABLES

In this menu you can switch on resp. off the BAT- and SDT-OTHER tables.

—> **BAT** = **B**ouquet **A**ssociation **T**able:
Information in the data stream about the affiliation of station packets to a specific bouquet.

—> **SDT-OTHER** = **S**ervice **D**escription **T**able – **OTHER** data streams:
Information in the data stream about service parameter of other data streams.

- Using the < button place the cursor under "**bat**" and switch "on" ("**BAT**") or "off" ("**bat**") the bouquet association table using the ^ v buttons.
- Using the > button place the cursor under "**sdt-other**" and switch "on" ("**SDT-OTHER**") or "off" ("**sdt-other**") the service description table using the ^ v buttons.

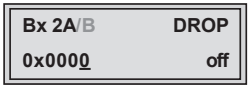
—> Capital letters: Function activated
Lower case letters: Function deactivated (factory default)

- Press the M button.

—> The "Deleting a PID" – "**DROP**" submenu is activated.

Deleting a PID

In this menu a PID of the transport stream can be deleted.



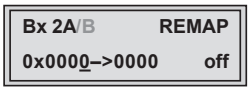
- Use the < > buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be deleted ("**0x0000**") and set the hexadecimal number using ∧ ∨.
- Use the > button to set the cursor under "**off**" and delete the PID using the ∧ ∨ buttons ("**on**").

- Press the **M** button.

—> The "Renaming a PID" – "**REMAP**" submenu is activated.

Renaming a PID

In this menu you can allocate a new address to a PID retaining the complete data content.



- Use the < > buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be changed ("**0x0000**") and set the hexadecimal number using ∧ ∨.
- Use the < > buttons to place the cursor under the respective digit of the hexadecimal number of the new PID ("**–> 0000**").
- Set the hexadecimal number using ∧ ∨.
- Use the > button to set the cursor to "**off**" and rename the PID using the ∧ ∨ buttons ("**on**").

- Press the **M** button.

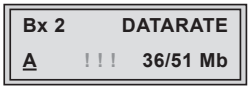
—> Returning to "Option settings" main menu (page 26).
—> If necessary set further channel strips.

- Press the **M** button.

—> The "Output data rate" – "**DATARATE**" main menu is activated.

OUTPUT DATA RATE

This menu shows the output data rate defined using the QAM settings and the current needed output data rate.



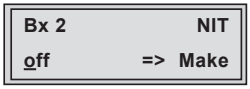
36: The current needed output data rate.
51: Maximum output data rate (dependent on the settings of modulation and symbol rate).

If the station filter is set correctly, the current needed data rate is lower than the maximum data rate. The value fluctuates, since the data rates of individual stations are dynamically modified by the broadcasters.

—> Is the current needed data rate higher than the maximum data rate exclamation marks "**!!!**" appear in the display and the status LED is blinking red/green. In this case correct the QAM settings (pages 17) or the settings of the station filter (page 21).

- Press the **M** button.

—> The "Network Information Table" – "**NIT**" menu is activated.



- To switch NIT "**on**" resp. "**off**" press the ⋀⋁ buttons.
- Press the ⋗ button to activate NIT ("**Make**").

⚠ All active modules which are able to output a NIT ("NIT modules") must be set and ready for reception.

—> The NIT of all "NIT modules" are switched on.
—> The module fetches all the information (output frequencies, output data rates, etc.) it needs from all the "NIT modules" in order to generate the NIT. This process may take a few seconds.
Then the NIT is generated, added and sent to all "NIT modules". The other "NIT modules" also add this new NIT. The status of all "NIT modules" in the NIT menu changes to "**on**".
The display shows: "**read ... / copy ...**".

- To switch off the new NIT ("**off**") press the ⋁ button.

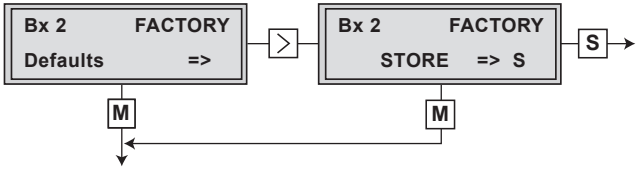
—> ⚠ The NITs of the other "NIT modules" will stay switched on. When the NIT of the module is switched on again ("**on**") by pressing the ⋁ button, the previously generated NIT is added again. If you have changed parameters in the meantime, you must first select "**Make**" to generate a new, up-to-date NIT.

- Press the M button.

—> The "Factory reset" – "**FACTORY Defaults**" main menu is activated.

FACTORY RESET

In this menu you can reset all settings to the factory defaults.

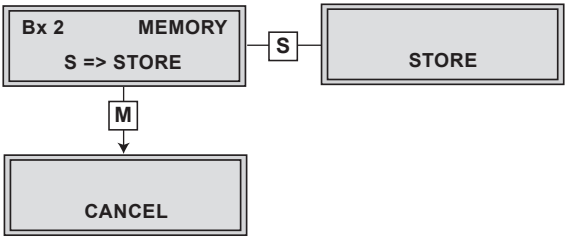


- Press the [>] button.

—> The factory defaults are invoked (**"FACTORY STORE"**).
—> By pressing the [M] button, you will be returned to the menu item "Output parameter" **without** invoking the factory defaults (page 15).

- Press the [S] button.

—> The factory defaults are saved.
The display shows "STORE"
—> Back to "Selecting the module" (page 15).
—> By pressing the [M] button, you will be returned to the menu item "Output parameter" **without** saving the factory defaults (page 15).
—> If necessary set another channel strip.



- All programmed data is saved by pressing the **S** button. You will be returned to the menu item "**Selecting the module / channel strip**" via Ⓐ (page 15).

—> By pressing the **M** button, you will be returned to the menu item "**Selecting the module / channel strip**" **without** saving the programmed data.

6 Final procedures

After installing the head-end station, upgrading accessories or installing modules it is necessary to tighten all cable connections, cable terminals and cover screws in order to maintain compliance with current EMC regulations.

- Securely tighten the cable connections using an appropriate open-ended spanner.
- Test the output level of the output collector according to the STC 160 assembly instructions and set the output level required for the cable system.
- Mount the base plate and the front cover (see STC 160 assembly instructions).

Advice for a frequency grid (8 MHz) in the band I/III

Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]
42.00	82.00	146.00	186.00	226.00	266.00
50.00	114.00	154.00	194.00	234.00	274.00
58.00	122.00	162.00	202.00	242.00	282.00
66.00	130.00	170.00	210.00	250.00	290.00
74.00	138.00	178.00	218.00	258.00	298.00

CCIR – Hyperband (frequency grid 8 MHz)

Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]
S 21	306.00	S 26	346.00	S 30	378.00	S 34	410.00	S 38	442.00
S 22	314.00	S 27	354.00	S 31	386.00	S 35	418.00	S 39	450.00
S 23	322.00	S 28	362.00	S 32	394.00	S 36	426.00	S 40	458.00
S 24	330.00	S 29	370.00	S 33	402.00	S 37	434.00	S 41	466.00
S 25	338.00								

CCIR – Band IV/V (frequency grid 8 MHz)

C 21	474.00	C 31	554.00	C 41	634.00	C 51	714.00	C 61	794.00
C 22	482.00	C 32	562.00	C 42	642.00	C 52	722.00	C 62	802.00
C 23	490.00	C 33	570.00	C 43	650.00	C 53	730.00	C 63	810.00
C 24	498.00	C 34	578.00	C 44	658.00	C 54	738.00	C 64	818.00
C 25	506.00	C 35	586.00	C 45	666.00	C 55	746.00	C 65	826.00
C 26	514.00	C 36	594.00	C 46	674.00	C 56	754.00	C 66	834.00
C 27	522.00	C 37	602.00	C 47	682.00	C 57	762.00	C 67	842.00
C 28	530.00	C 38	610.00	C 48	690.00	C 58	770.00	C 68	850.00
C 29	538.00	C 39	618.00	C 49	698.00	C 59	778.00	C 69	858.00
C 30	546.00	C 40	626.00	C 50	706.00	C 60	786.00		

CE - Declaration of Conformity

GSS	Konformitätserklärung Declaration of Conformity 142/ 13	CE

Der Hersteller/Importeur The manufacturer/importer	**GSS Grundig SAT Systems GmbH**
Anschrift / Address / Adresse	**Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product:

Bezeichnung / Name / Description	**Head- End Digital Transmodulator 2x DVB-C2/T2 -QAM**
Type / Model / Type	**GSS HD2CT 860 C**
Bestell-Nr. / Order-No.	**GBK 0200**

folgenden Normen entspricht:
is in accordance with the following specifications:

EN 50083-2:	***2012***	***EN 60950:***	***2006***
EN 50581:	***2012***	***EN 60950-1 +A11 :***	***2009***
		EN 60950-1 +A1 :	***2010***

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:

2006/95/EG	**Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen Directive relating to electrical equipment designed for use within certain voltage limits**
2004/108/EG	**Richtlinie über die elektromagnetische Verträglichkeit Directive relating to electromagnetic compatibility**
2011/65/EG	**Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronik Altgeräten Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment**

Nürnberg, 16. September 2013

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Leiter Entwicklung
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